
Regulation of human neural progenitor cell proliferation by Ryk-mediated Wnt signaling

Grant Award Details

Regulation of human neural progenitor cell proliferation by Ryk-mediated Wnt signaling

Grant Type: SEED Grant

Grant Number: RS1-00262

Investigator:

Name: Wange Lu

Institution: University of Southern California

Type: PI

Human Stem Cell Use: Embryonic Stem Cell

Award Value: \$624,000

Status: Closed

Progress Reports

Reporting Period: Year 2

View Report

Reporting Period: NCE

View Report

Grant Application Details

Application Title: Regulation of human neural progenitor cell proliferation by Ryk-mediated Wnt signaling

Public Abstract:

Human ES cells can be used to make healthy neurons to replace the cells that are lost in neurological diseases such as Alzheimer's and Parkinson's diseases. This holds great hope for future treatment of these disorders. Our research aims to produce neurons from ES cells more efficiently. During the process of differentiation to form nerve cells, human ES cells first develop into primitive neural progenitor cells before they become mature functional neurons. Our research focuses on how we can expand the neural progenitor cell population.

We have found that a cell surface protein called Wnt can expand neural progenitor cells. However, it is not clear how this protein can make human neural progenitor cells grow. This proposal will address the question. We will determine which surface molecules can recognize Wnt and how these signals control cell growth. This proposed research will help us to find a method to expand neural progenitor cells and thus make more neurons in the future. This will eventually contribute to the clinical application of human embryonic stem cells in the treatment of neurological diseases.

Statement of Benefit to California:

Neurodegenerative diseases, such as Alzheimer's and Parkinson diseases, and neuronal injuries caused by stroke and trauma, will result in neuronal cell loss. Current treatments cannot replace or recover the neuronal loss. Our proposed research ultimately may lead to the development of an effective treatment for the neuronal cell loss. Once we find a detailed Wnt pathway to control neural progenitor cell expansion, there will be many possible clinical applications. Transplant-ready neuronal tissues, gene therapy, and drugs targeting the Wnt pathway to promote neuronal regeneration are some of the treatments of the future for neurological disorders. Our finding will facilitate the progress of developing those new, promising treatments. The success of our project in neural progenitor cells expansion will greatly improve the quality of health for Californians.

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